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Horse Head
Zinc
Eaves Troughs Gutters
and Conductor Pipes

zinc
Eaves Troughs, Gutters
and Conductor Pipes
12i

Supplementary copies of any of the sketches in this book will be sent upon receipt of application calling for them by numbers.

Additional Specification Books can be obtained by a request under your business letterhead.

The New Jersey Zinc Co. will be glad to have you take up with them any questions of proper specifications and construction details for any type of sheet metal or roofing work.

AUG 24 1925



ZINC
Eaves Troughs, Gutters
and Conductor Pipes
12i



HORSE HEAD zinc

EAVES TROUGHS GUTTERS
AND CONDUCTOR PIPES

*Detailed Specifications for the
use of Architects and Builders*



*The World's Standard
for Zinc Products*

THE NEW JERSEY ZINC COMPANY

Established 1848

MAKERS OF HORSE HEAD ROLLED ZINC

Products Distributed by

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THE NEW JERSEY ZINC COMPANY



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FOREWORD

IN presenting this specification to Architects, Engineers, and Contractors, it has been our aim to cover thoroughly only one subject under the heading of Building Sheet Metal Work. This particular specification treats only of Eaves Troughs, Gutters and Conductor Pipes. Other and separate folders covering specifications for Roofing, Flashings and various phases of Sheet Metal Work will be issued later.

Zinc for Sheet Metal Work has been little used in this country due in the main to a lack of understanding; an understanding not only of its own inherent worth and permanence, but of the proper methods of using it in building work. We look to European countries for what their old masters can teach us in art and architecture, but we can also find at the same source their instruction in permanent sheet metal work at low cost, an end which they achieved by the use of Zinc. The instructions contained in this specification will, if followed, guard against the improper use of Zinc and will eliminate poor results due to faulty construction.

Grateful acknowledgment is made for the valuable assistance and criticism which we have received from Architects, Engineers, and Sheet Metal Contractors, during the preparation of this book. We can only hope that you will find the information useable and valuable.

THE NEW JERSEY ZINC COMPANY
Established 1848



INFORMATION ON ZINC

IT IS not our intention to cumber this specification with sales arguments in favor of Zinc. There is, however, certain information on Zinc that does not come within the true scope of a specification, which, if omitted, would make this folder an incomplete tool.

Durability Zinc is a metal, not an alloy of other metals, which is extremely resistant to the corrosive action of the elements. It rapidly acquires a protective coating (a basic carbonate of Zinc) which will continue to form as long as there is any raw Zinc exposed.

Color This protective coating gives the metal a light battleship grey color which will deepen with age and approach the color of slate.

Zinc does not need paint as a protection, but paint can be readily used if other than the natural color of Zinc is desired. See Appendix III for painting specifications.

No Stain Since all the common chemical salts of Zinc are white, Zinc sheet metal work cannot stain marble, stucco, or light colored surfaces.

Cost The cost of Zinc is approximately half way between the cost of copper and of galvanized steel of equal thickness, though this may vary slightly due to changes in the market prices.

HORSE HEAD ZINC

Weight The weight of Zinc per square foot is less than that of lead, copper and galvanized steel of the same thickness. See Appendix IV.

Workability Pure rolled Zinc—Horse Head Brand—can be bent and formed as easily as any other metal now in common use for Building Sheet Metal Work. Such bending and forming should not be done when the temperature is less than forty degrees Fahrenheit.

Wood Shingles Since certain woods, notably redwood and red cedar, contain acids which are harmful to metals, the use of Zinc eaves troughs and conductor pipes on buildings roofed with such shingles is not recommended.

Expansion and Contraction Like all metals Zinc expands and contracts with changes in temperature. Full allowance should be made, as shown in these specifications, for this. The use of Cornice Crimped Zinc reduces the effects of expansion and contraction to a minimum.





SPECIFICATIONS FOR ZINC EAVES TROUGH, GUTTERS AND CONDUCTOR PIPES

General

All eaves troughs, gutters, conductor pipes, and their fittings—elbows, mitres, end caps, drops, shoes, etc.—as well as all leader heads and ornamental straps, shall be made from Horse Head Rolled Zinc not less than number eleven (11) zinc gauge (0.024" thick). The eaves troughs, gutters, conductor pipes and their fittings shall be made of cornice crimped metal.

Hanging Eaves Troughs All hanging eaves troughs shall be of the type and sizes¹ shown on the drawings, and shall be in standard sections with slip or lap joints. They shall be supported by hangers of the shank and circle type (See Fig. 2) which must be spaced not more than two (2') feet apart and not more than eight (8") inches from each end or corner.² Heavily zinc-coated (galvanized) hangers are recommended in preference to tinned ones, though the latter may be used if the former are not obtainable.

¹ See Appendix I for Table of Standard Types and Sizes.

² When eaves trough hangers of the shank and circle type are not obtainable or cannot be used, the use of strap hangers of pure zinc or of heavily zinc-coated (galvanized) iron is recommended. (See Fig. 12).

HORSE HEAD ZINC

All mitres, end caps, outlets, etc., shall be securely soldered.¹ (See Fig. 3). The slip joints connecting eaves trough sections may be soldered if desired. All lap joints must be soldered.

O. G. Gutters or

Ornamental Eaves Troughs All eaves troughs of this type shall be made from cornice crimped metal in sections not more than eight (8') or ten (10') feet long. The size and detail of the face shall be in accordance with the specifications or drawings. These eaves troughs shall be supported by heavily zinc-coated (galvanized) iron straps² not less than one-sixteenth ($\frac{1}{16}$ ") inch thick and not less than one (1") inch wide, which must in every case support the gutter from the underside. (See Fig. 4). These straps shall be spaced every two (2') feet. The eaves trough sections shall be soldered together.

Box or Lined Gutters All gutters of this type shall be lined with cornice crimped metal in sheets not over ten (10') feet long and of the width required by the size of the gutter. The sheets shall be lock seamed and soldered together throughout their entire width except at the expansion joints. The joints should overlap in the direction of the slope of the gutter. (See Fig. 5).

¹ See Appendix II for Soldering information.

² In case the strap around the face of the gutter is objectionable, a moulding or similar support should be placed under the gutter and be sufficiently wide to hold it securely. If this construction is used, it should be distinctly shown on the drawings. A strap at the top is always necessary.

HORSE HEAD ZINC

Box or Lined gutters are of different types as shown by the following sketches. (See Figs. 6 and 7.) It is important to note that, whenever the foot of the roof (marked C) is less than one and one-half ($1\frac{1}{2}$ ") inches higher, measured vertically, than the top of the cornice (marked A), the gutter lining sheets must be extended, without an open break, up the roof to a point (marked B) which is the required distance above the top of the cornice. This will insure, in case of a stoppage in the gutter, that the water will be forced over the cornice instead of seeping into the building.

In fastening the edges of the sheets to the roof proper and to the cornice, the metal must not be nailed but shall be fastened by Zinc clips spaced every ten ($10''$) to twelve ($12''$) inches. These clips shall be of the same thickness as the gutter lining and approximately one ($1''$) inch by three ($3''$) inches in size. Heavily zinc-coated (galvanized) nails or screws shall be used to fasten down the clips.

In lining box gutters, sharp right angles shall be avoided and all bends be made with a slight radius. The gutter lining sheets shall not be formed to a tight fit in the gutter, but allowance shall be made for expansion throughout its length and girth.

Expansion Joints All box or lined gutters more than twenty-five ($25'$) feet long shall have an expansion joint, which must be located at the high point of the gutter. From each expansion joint the water flows in opposite directions towards



HORSE HEAD ZINC



the outlets. The greatest distance allowable between expansion joints shall be forty-five (45') feet. An expansion joint shall be located not more than twenty-five (25') feet from each mitre or corner. (See Fig. 5). Figure 8 shows the details of construction for expansion joints.

Roof Gutters Gutters of this type (See Fig. 9) shall be lined with cornice crimped metal in accordance with the details of construction given under the heading "Box or Lined Gutters."

Conductors or Leader Pipes All conductor pipes shall be of the type and sizes¹ shown on the drawings and shall be in standard sections. These shall be fastened to the building wall by means of adjustable fasteners of the rack and pin type. (See Fig. 11.) Heavily zinc-coated (galvanized) hooks are recommended in preference to tinned ones, though the latter may be used if the former are not obtainable.²

All elbows, shoes, goosenecks, etc., shall be securely soldered. (See Fig. 3.)

Where conductor pipes are to be connected with cast iron or other metallic soil pipes, the joint shall be made with elastic roofing cement in such manner that the zinc conductor pipe does not come into actual contact with the soil pipe. If non-metallic soil pipes are used, elastic roofing cement shall be employed to make the connection tight.

¹ See Appendix I for Table of Standard Types and Sizes.

² When conductor pipe fasteners of the rack and pin type are not obtainable or cannot be used, the use of hinged hooks of heavily zinc-coated (galvanized) iron is recommended. In such cases the hook shall be fastened to the conductor pipe with solder to prevent slipping. (See Fig. 12.)

HORSE HEAD ZINC

Ornamental Leader

Heads and Straps All ornamental leader heads and straps shall be made in accordance with the specifications for shape, size and design given by the architect. They shall all be made from Horse Head Rolled Zinc not less than number eleven (11) zinc gauge (0.024" thick) and may be either of crimped or plain metal.

All ornamental straps shall be located as indicated either in the drawings or in the written specifications. These straps are purely ornamental and shall not be made to support the conductor pipes.

When the work is completed, all nails, scraps, etc., shall be removed, all traces of flux wiped off and the job left clean and shipshape.





HORSE HEAD ZINC

APPENDIX I

TABLE OF STANDARD SIZES

I. Hanging Eaves Troughs or Gutters. See Fig. 1.

- A. Types: 1. Single Bead.
2. Double Bead.

- B. Sizes: Sizes are given in terms of the diameter of the eaves trough sections and are 3 inch, 4 inch, 5 inch, 6 inch, 7 inch, 8 inch, 9 inch and 10 inch.

Note: Whenever eaves troughs larger than six (6") inch are specified, they shall always be double bead and the hanger spacing shall be reduced to eighteen (18") inches. For such gutters the use of zinc thicker than 0.024 inches is recommended.

- C. Fittings: Eaves trough fittings—mitres, end caps, etc.—are manufactured in the same types and sizes as the eaves troughs.

II. Conductors or Leader Pipes. See Fig. 10.

- A. Types: 1. Plain Round.
2. Round Corrugated.
3. Plain Square.
4. Square Corrugated.

- B. Sizes: Sizes of round conductor pipes are given in terms of the diameter of the pipes, and are 2 inch, 3 inch, 4 inch, 5 inch, and 6 inch.

Sizes of square conductor pipes vary slightly in different parts of the country. They are approximately as follows:

- 2 inch ($1\frac{7}{8}$ " by $2\frac{1}{8}$ ")
3 inch ($2\frac{1}{8}$ " by $3\frac{1}{8}$ ")
4 inch ($2\frac{3}{4}$ " by $4\frac{1}{4}$ ")
5 inch ($3\frac{3}{4}$ " by 5")

- C. Fittings: Conductor pipe fittings—elbows, shoes, etc.—are manufactured in the same types and sizes as the conductor pipes.



HORSE HEAD ZINC

APPENDIX II

SOLDERING

The surfaces to be soldered shall be carefully cleaned and all traces of grease, dirt, oxide, etc., removed. Cut or killed muriatic acid shall be used as a flux. Half and half solder, free from antimony, shall be used. Use a moderately hot iron while the surfaces to be soldered are still moist with the flux. The iron shall not be allowed to become red hot nor should it be applied to the zinc longer than is necessary to give a good joint (one quick pass is usually sufficient). After the solder has hardened remove carefully all traces of acid or flux. It is advisable to use a heavy soldering iron instead of a light one as the heat can be kept more uniform and the iron is not so quickly cooled.



APPENDIX III

SPECIFICATIONS FOR PAINTING ROLLED ZINC

The surface of the Zinc shall be prepared for painting by either one of the following methods:

- I. The surface of the Zinc shall be allowed to become weathered by exposure to the elements for at least two months. Any loose powder or dirt shall then be brushed off, the surface dried, and paint applied as specified below.
- II. The surface of unweathered Zinc shall be painted with a solution of Copper Acetate and Water (six ounces per gallon) using a stiff brush and rubbing until a dark color appears. The surface shall then be allowed to dry, any loose powder be removed, and paint applied as specified below.

After the surface of the Zinc has been prepared as specified above and is in condition to give the paint an anchorage, a paint of the following formula shall be applied:

Pigment Portion	Maximum	Minimum
XX Black Zinc Oxide	75%	60%
Inerts (Barytes, Silica or Asbestine)	40%	25%

The vehicle shall contain, for the first coat at least 70% pure linseed oil (raw or boiled), and for the second coat at least 85% pure linseed oil. The balance in each case shall be turpentine and liquid drier. The proportions of vehicle and pigment shall be those required to obtain a good painting consistency.

A coat of red lead or other metal primer is unnecessary and shall not be used.

HORSE HEAD ZINC

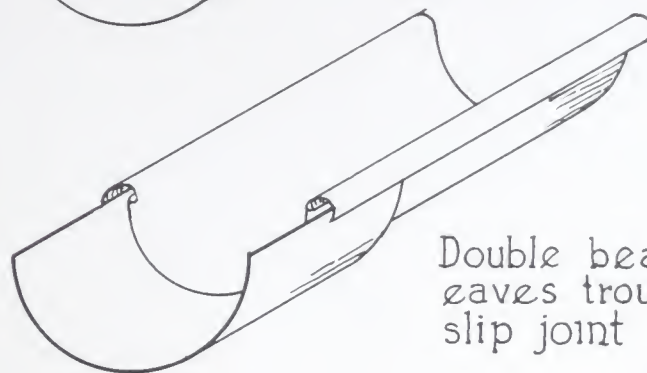
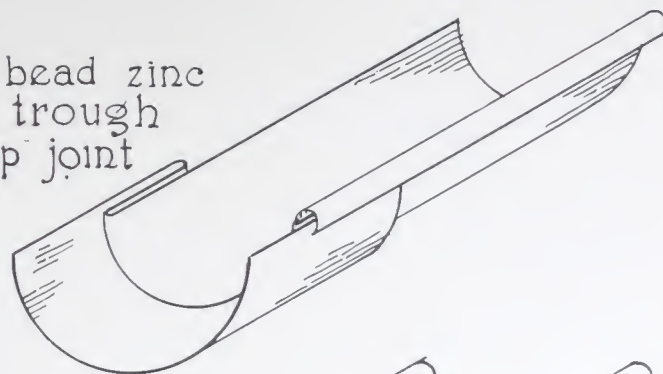
APPENDIX IV

Table showing different gauge systems in comparison, together with the equivalent thicknesses in decimal parts of an inch; also the approximate weights of one square foot of Rolled Zinc, Rolled Copper and Rolled Steel in the various thicknesses.

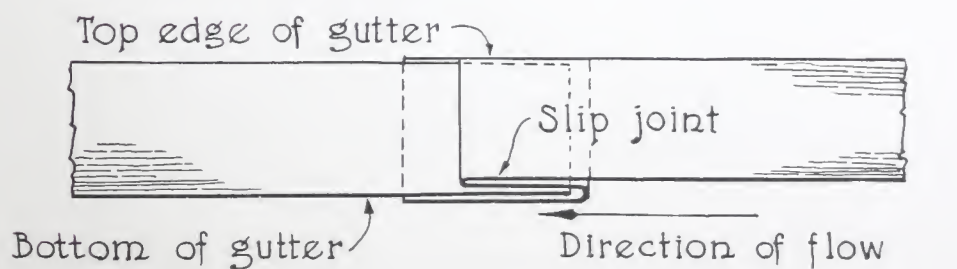
GAUGE TABLES				WEIGHT EXPRESSED IN POUNDS PER SQUARE FOOT OF		
Decimal parts of an inch	Rolled Zinc Gauge	Brown and Sharpe	U. S. Standard	Zinc lbs.	Copper lbs.	Steel* lbs.
.014	7	27	29	.52	.65 (10 oz.)	.57
.0156	..	..	28	.58	.72	.64
.016	8	26	..	.60	.74 (12 oz.)	.65
.0172	..	..	27	.64	.79	.70
.018	9	25	..	.67	.83	.74
.0188	..	..	26	.70	.87 (14 oz.)	.77
.020	10	24	..	.75	.92	.82
.0219	..	..	25	.82	1.01 (16 oz.)	.89
.0226	..	23	..	.84	1.04	.92
.024	11	..	..	.90	1.11 (18 oz.)	.98
.025	..	22	24	.93	1.16 (20 oz.)	1.02
.028	12	..	23	1.05	1.29	1.14
.0285	..	21	..	1.07	1.32	1.16
.032	13	20	22	1.20	1.49	1.31
.0344	..	..	21	1.29	1.59	1.41
.036	14	19	..	1.35	1.66	1.47
.0375	..	..	20	1.40	1.73	1.53
.040	15	18	..	1.50	1.85	1.63
.0438	..	..	19	1.64	2.02	1.79
.045	16	17	..	1.68	2.08	1.84

*For weight of galvanized steel add .155 lbs. to above figures.

Single bead zinc
eaves trough
with slip joint



Double bead zinc
eaves trough with
slip joint



Section showing construction of slip joint

ZINC EAVES TROUGHS WITH SLIP JOINT

FIGURE 1

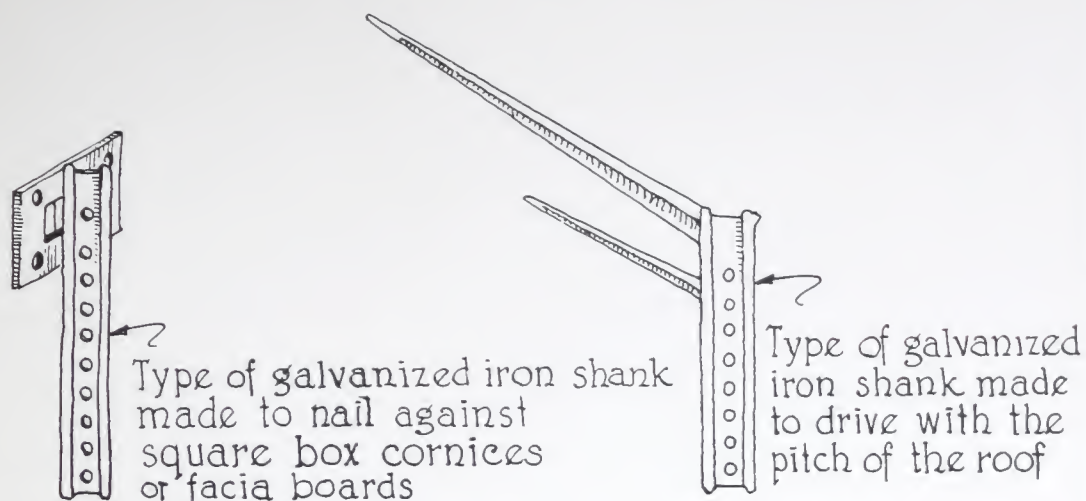
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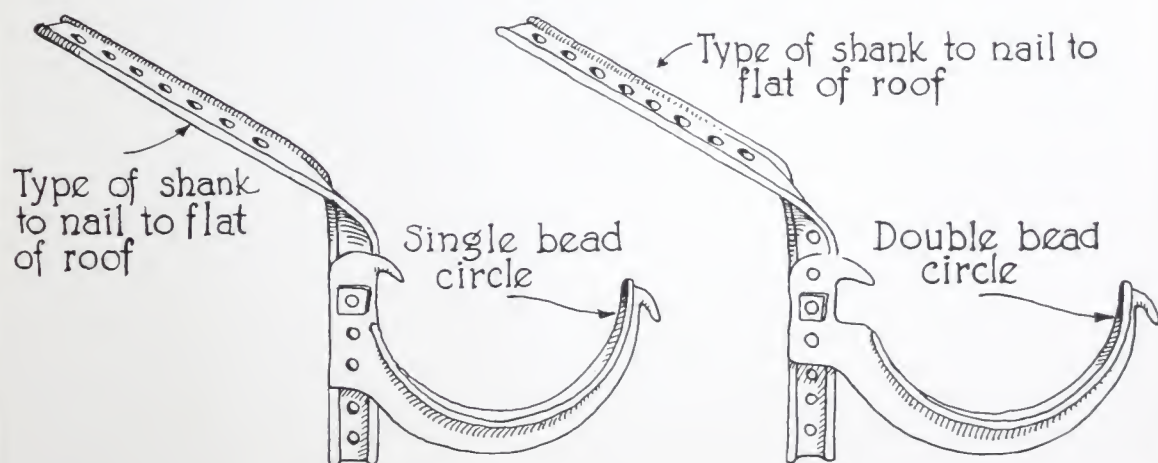


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TYPES OF SHANKS FOR GUTTER HANGERS



GALVANIZED IRON GUTTER HANGER WITH CIRCLE FOR SINGLE BEAD GUTTER

GALVANIZED IRON GUTTER HANGER WITH CIRCLE FOR DOUBLE BEAD GUTTER

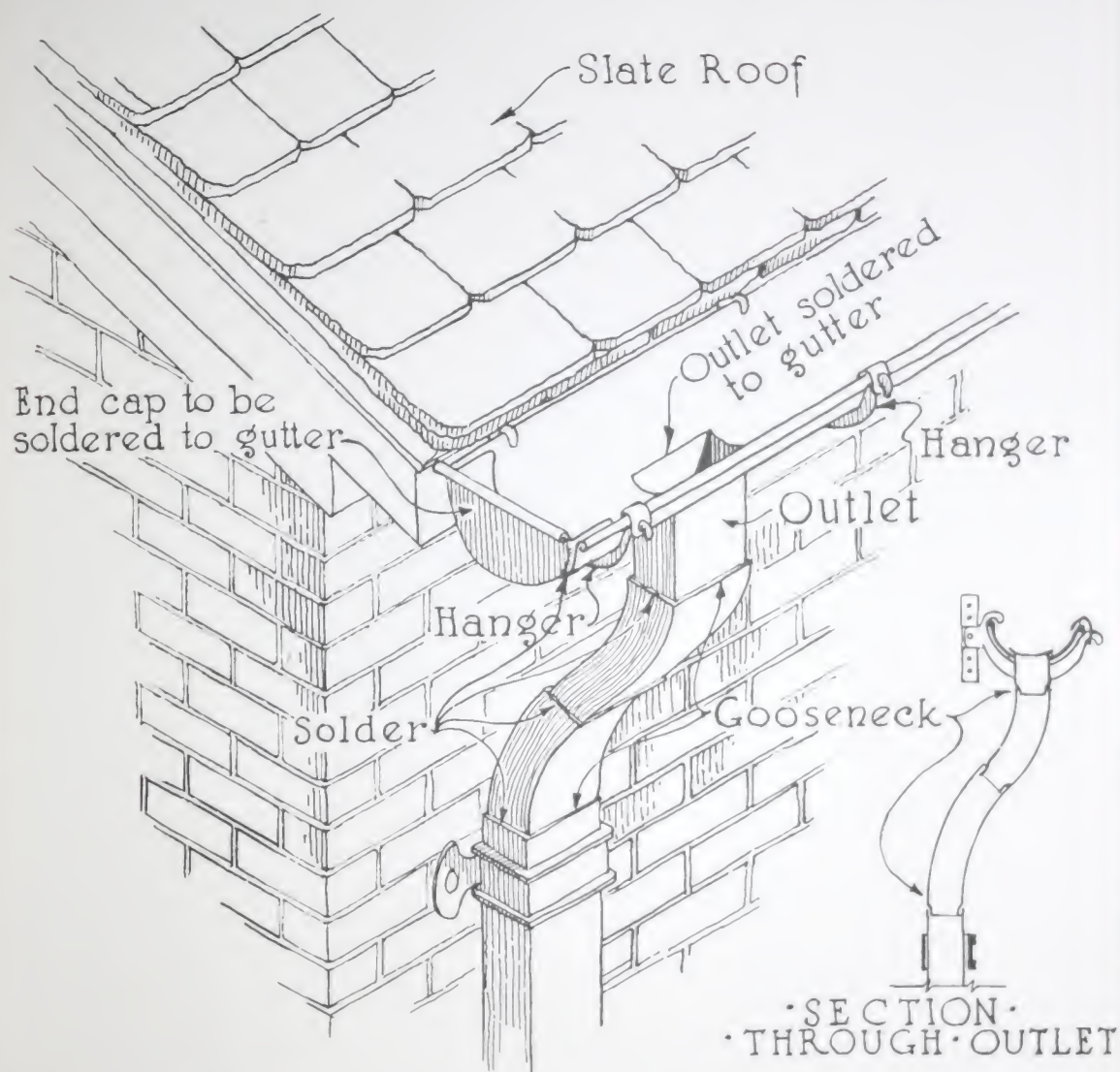
GUTTER HANGERS

FIGURE 2



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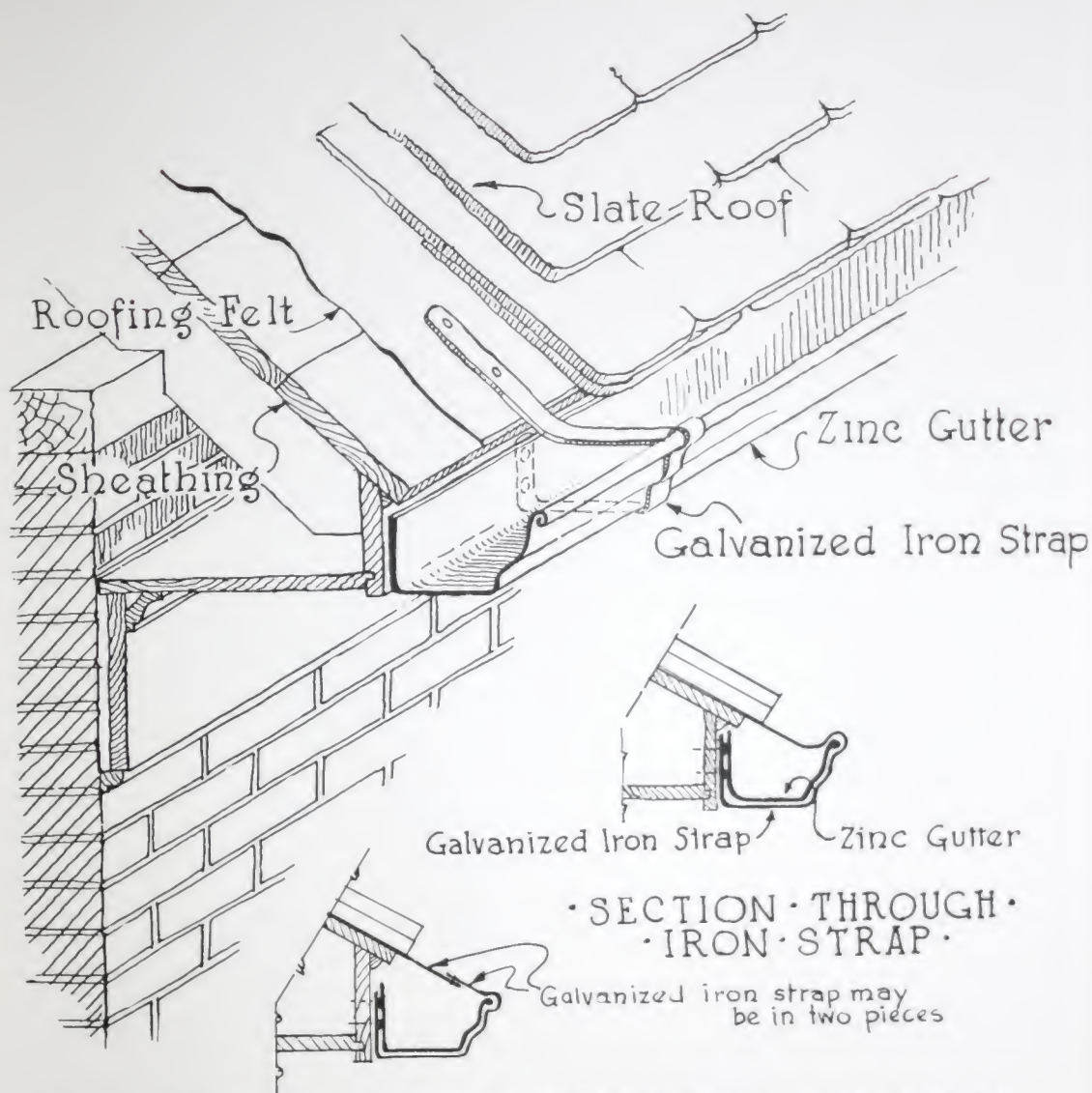
END OF GUTTER SHOWING ENDCAP, OUTLET
AND GOOSENECK . . . HANGERS SHOULD
BE PLACED NOT MORE THAN EIGHT INCHES
(8") FROM THE END OF THE GUTTER

FIGURE 3

Roof

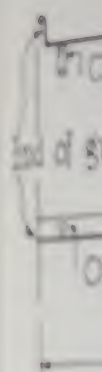
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O.G. GUTTER WITH GALVANIZED IRON STRAP
SUPPORTING GUTTER FROM THE BOTTOM...
STRAPS ARE TO BE NOT LESS THAN ONE
SIXTEENTH INCH ($\frac{1}{16}$ ") THICK AND NOT LESS
THAN ONE INCH (1") WIDE AND ARE TO BE
SPACED NOT MORE THAN TWO FEET APART

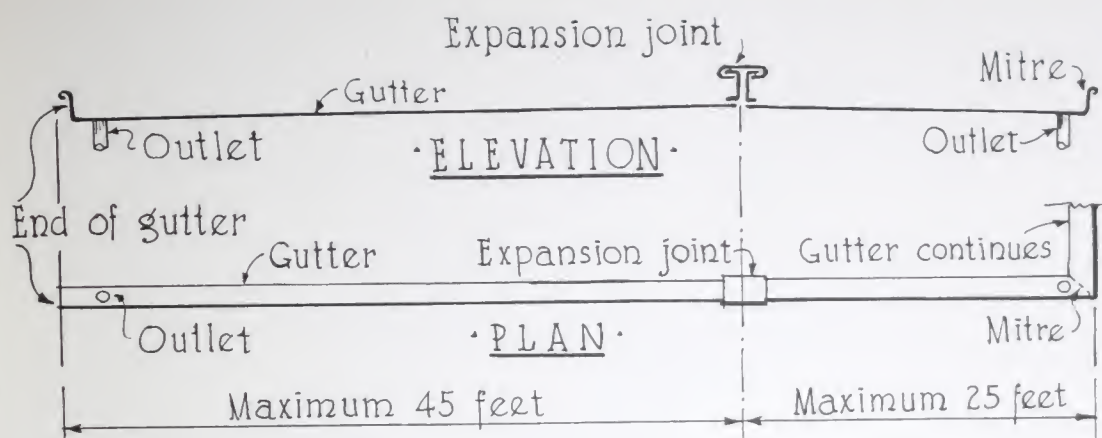
FIGURE 4



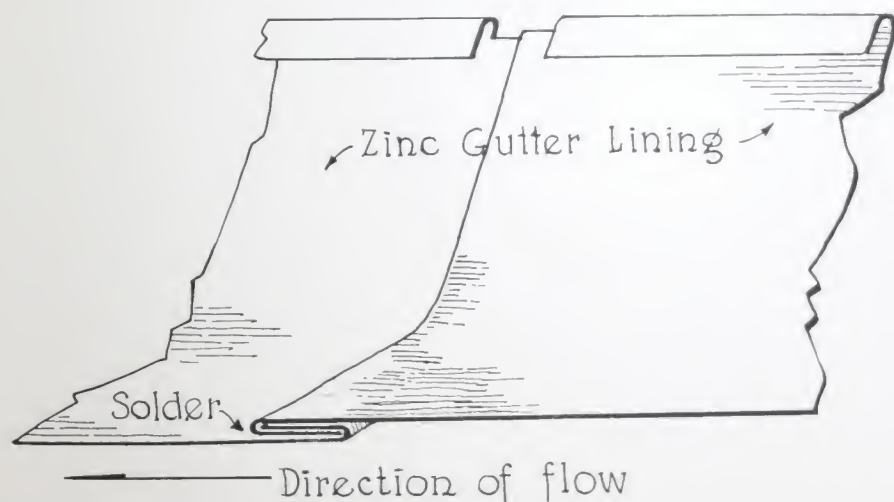
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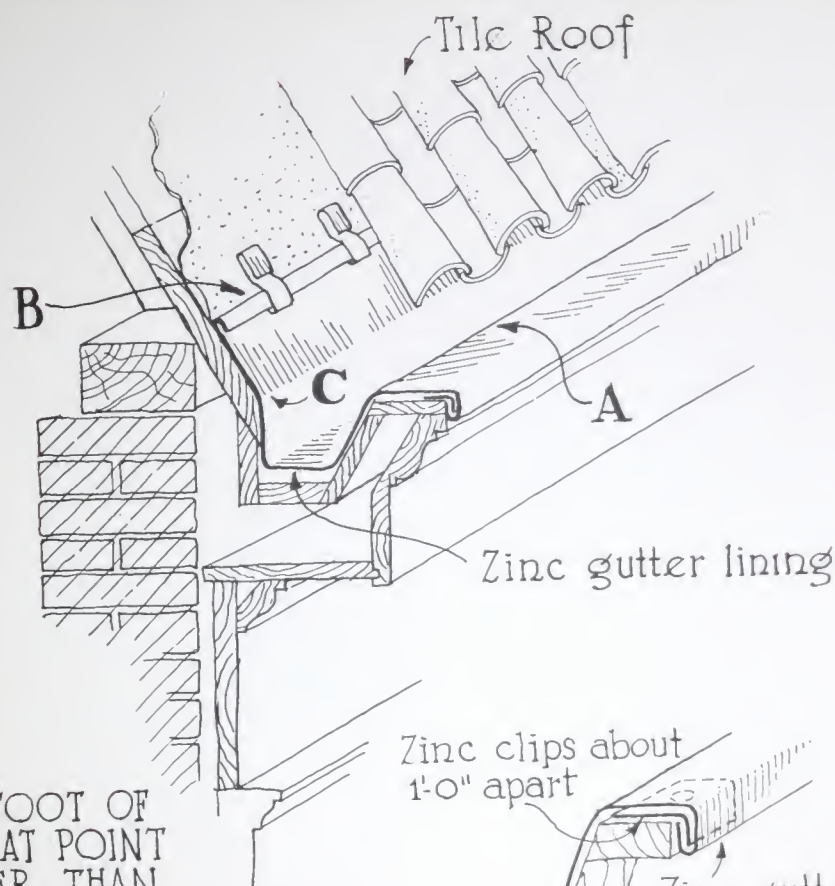
DIAGRAMS SHOWING POSITION OF EXPANSION JOINT



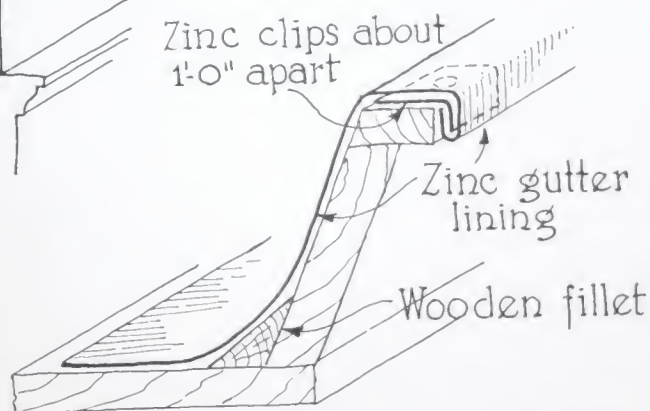
LOCK-SEAMED AND SOLDERED JOINT
CONNECTING ZINC SHEETS IN BOX GUTTER

FIGURE 5

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"C" IS LA
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WHERE THE FOOT OF THE ROOF AT POINT "C" IS LOWER THAN THE OUTER EDGE OF THE GUTTER AT "A", THE GUTTER SHEET SHOULD BE CARRIED UP TO "B" WHICH SHOULD BE AT LEAST $1\frac{1}{2}$ " ABOVE "A"



DETAIL ILLUSTRATING THE PROPER METHOD OF FORMING ZINC SHEETS IN GUTTER ENDS AND SIDES USING WOODEN FILLETS TO AVOID SHARP ANGLES

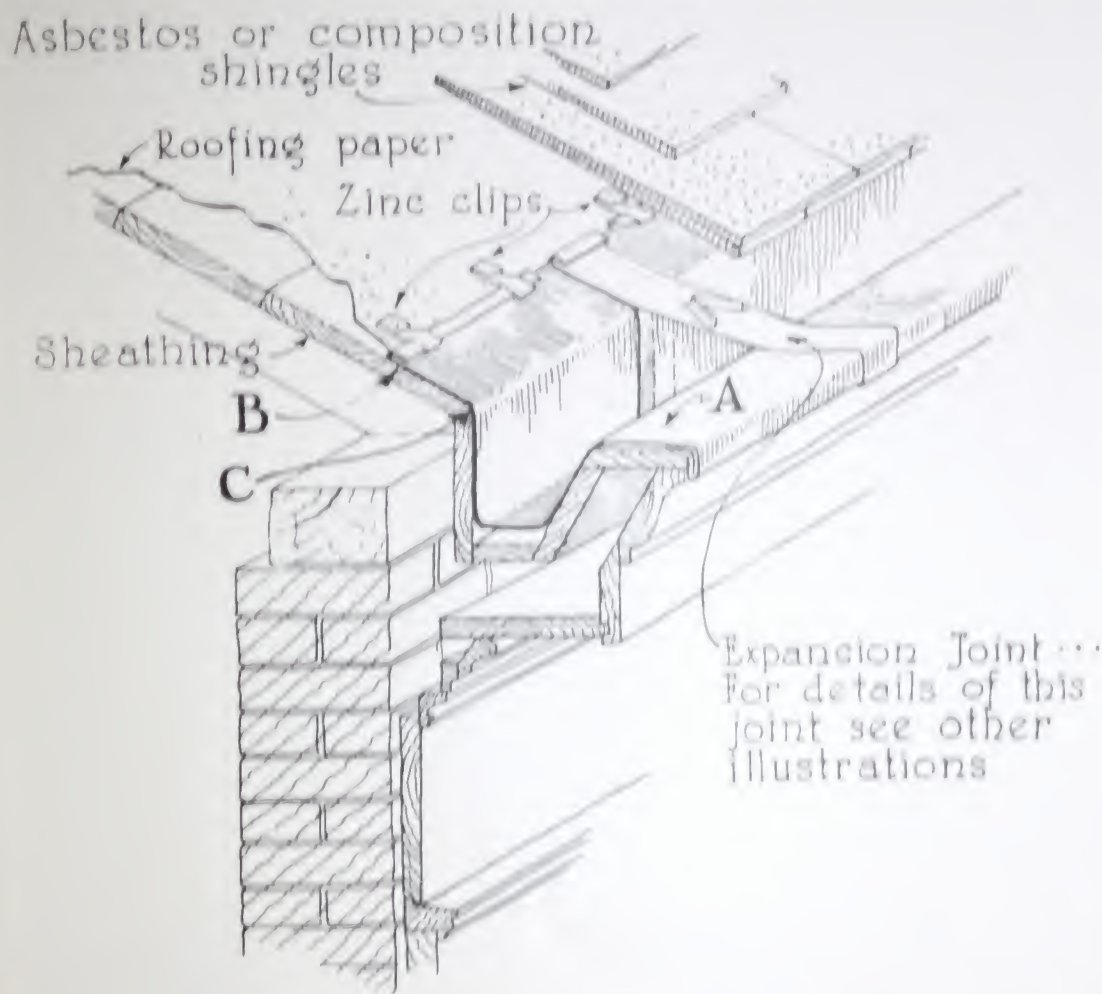
FIGURE 6

Asbest



Sheet

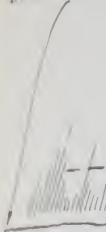
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IN A GUTTER OF THIS TYPE THE GUTTER SHEET SHOULD BE CARRIED UP TO THE LEVEL OF POINT "B" WHICH SHOULD BE AT LEAST ONE AND ONE HALF INCHES ($1\frac{1}{2}$ ") ABOVE THE LEVEL OF THE OUTSIDE EDGE OF THE GUTTER AT "A"

FIGURE 7

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Expansion joint

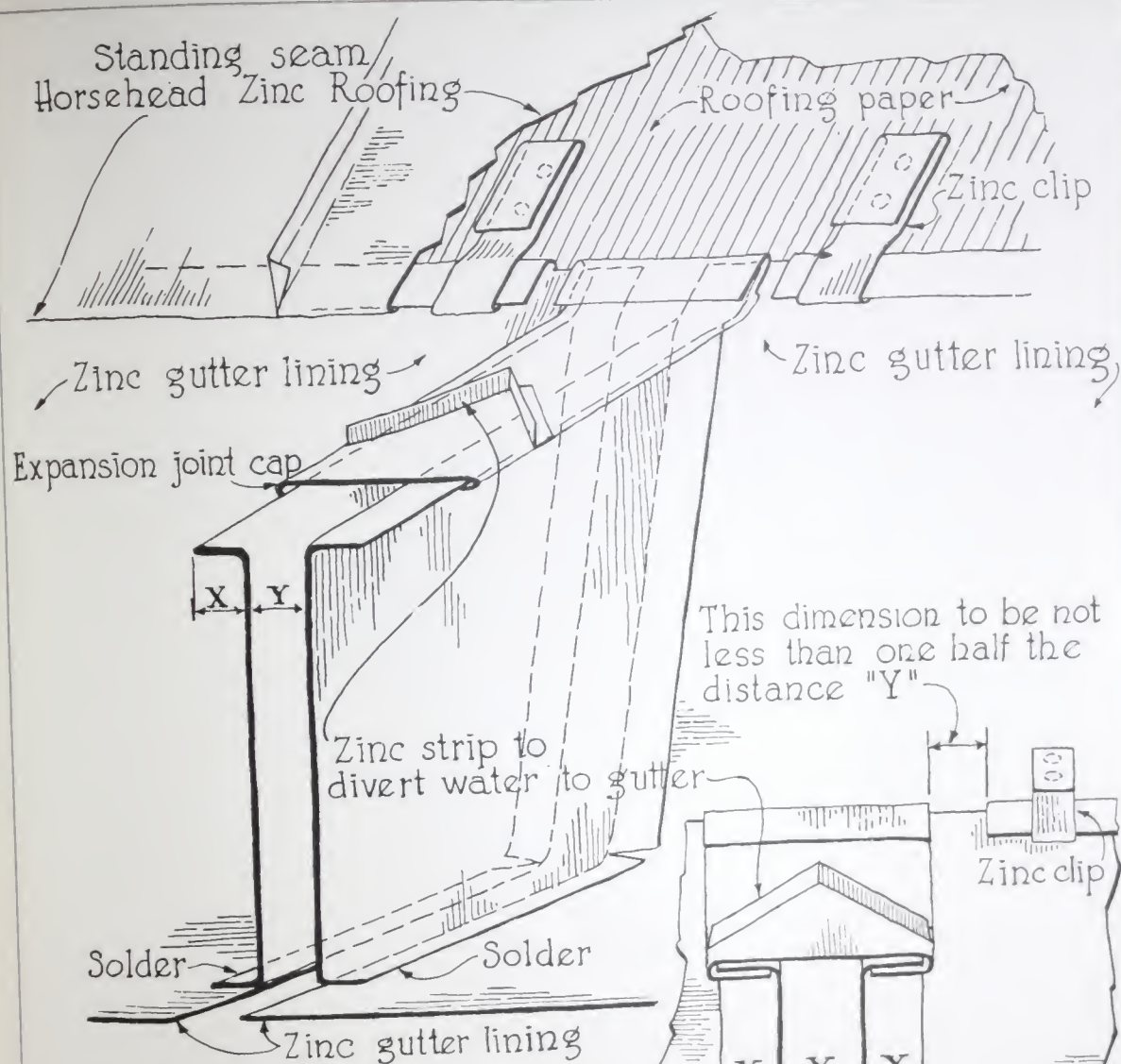


Solder



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EXPANS



THE JOINT IS SEEN IN THE POSITION OF EXTREME CONTRACTION OF THE GUTTER LINING SHEETS. NOTE THAT THE DISTANCE "X" SHOULD BE GREATER THAN ONE HALF THE DISTANCE "Y"

SECTION THROUGH EXPANSION JOINT

EXPANSION JOINT FOR BOX OR LINED GUTTERS
FIGURE 8

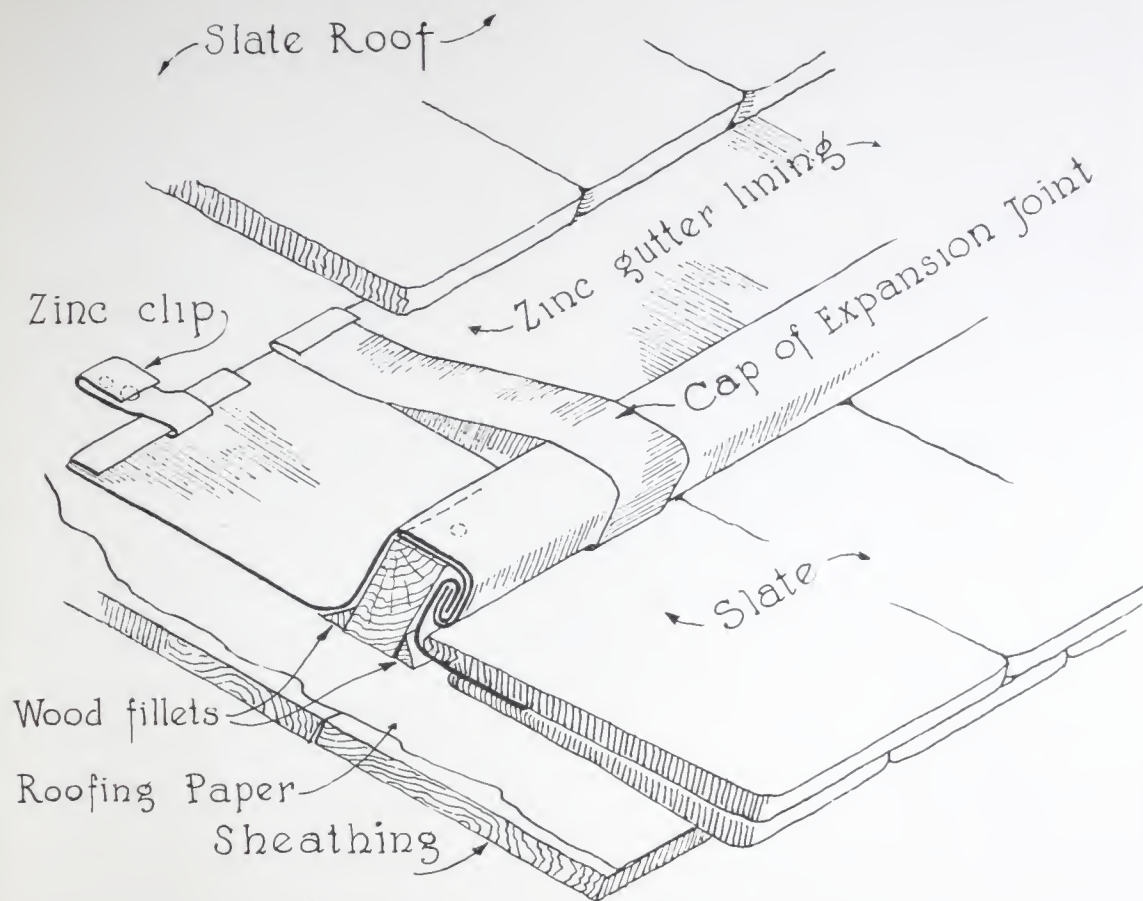
Zinc



Wood

Roofi

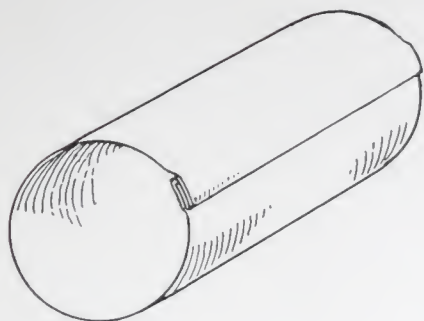
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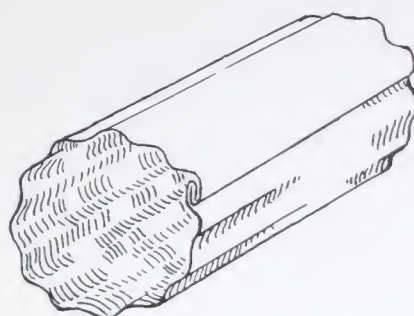
ROOF GUTTER LINED WITH ZINC . . . THE EXPANSION JOINT BETWEEN THE ZINC SHEETS LINING THE GUTTER IS SHOWN IN DETAIL IN OTHER ILLUSTRATIONS

FIGURE 9

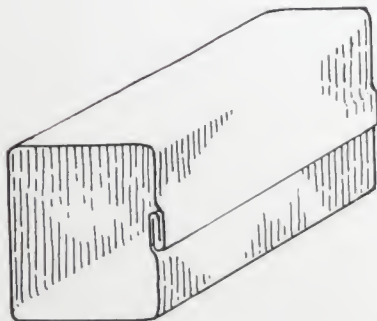




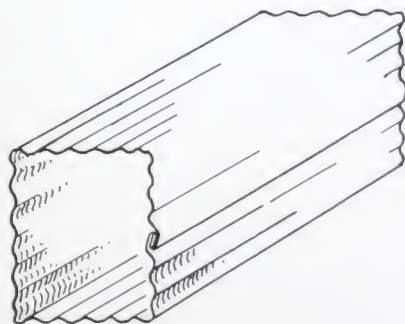
Plain Round



Corrugated Round




Plain Square




Corrugated Square

ZINC CONDUCTOR PIPE


FIGURE 10



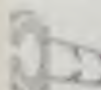
all lap joint
to be solved
SINGLE



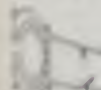
To screw



To drive

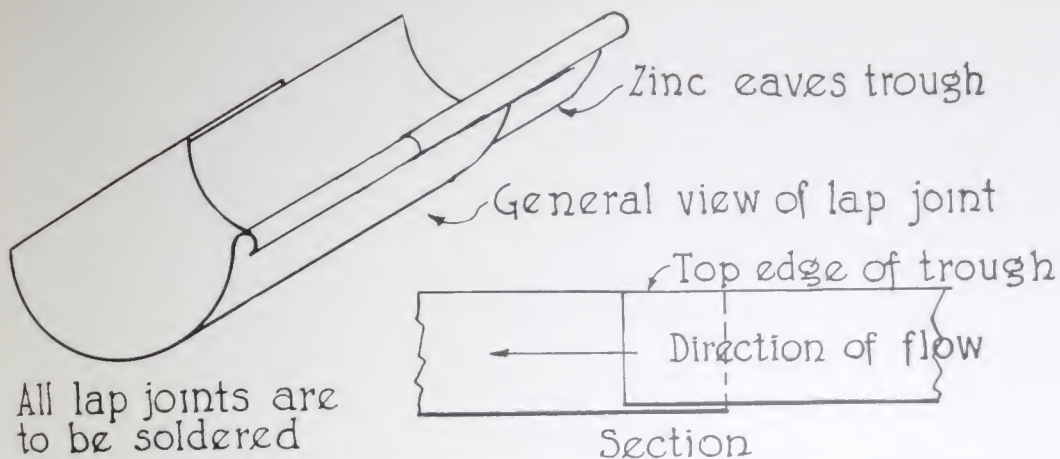


for use



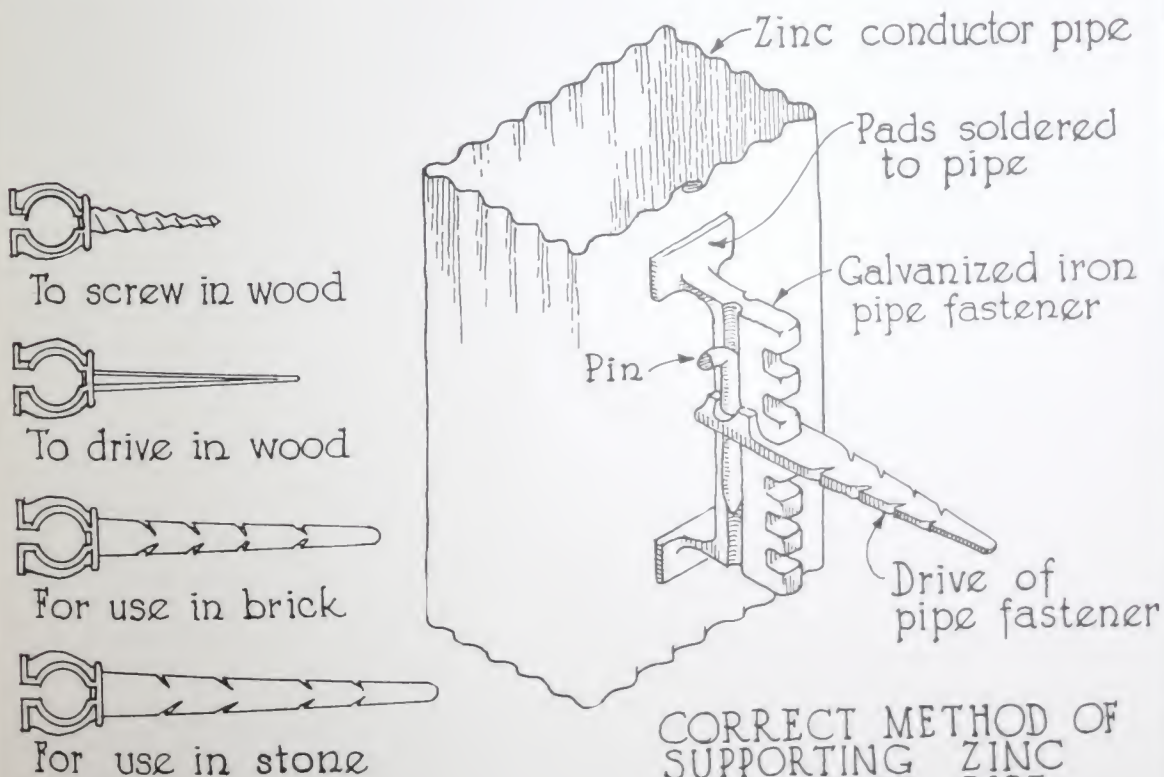
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All lap joints are to be soldered

SINGLE BEAD ZINC EAVES TROUGH WITH LAP JOINT



CORRECT METHOD OF
SUPPORTING ZINC
CONDUCTOR PIPE

TYPES OF DRIVES
FOR CONDUCTOR
PIPE FASTENERS

FIGURE 11

Section



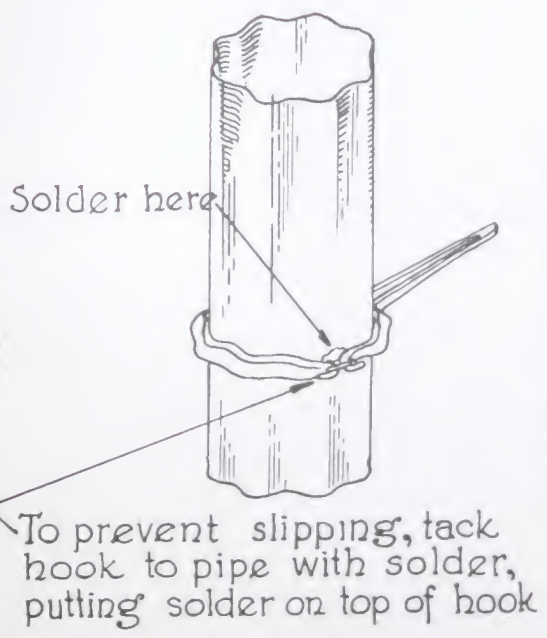
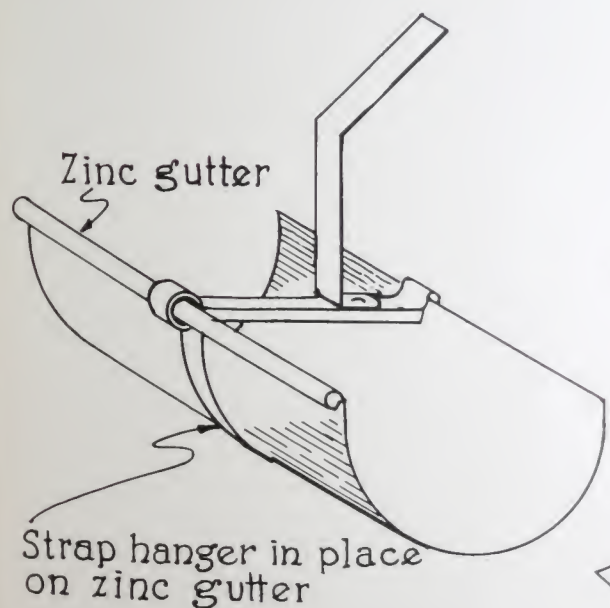
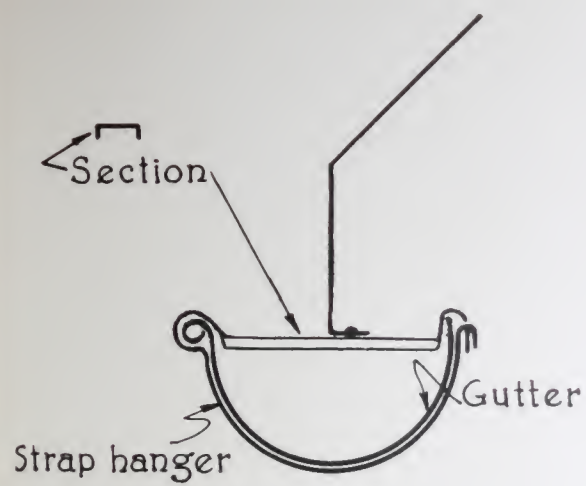
Strap hanger

Zinc gutter



Strap hanger
on zinc gutter

STRA
FOR



STRAP HANGERS
FOR GUTTERS

CORRUGATED
HINGED HOOKS
FOR LEADER PIPES

FIGURE 12

*This space is left
blank for your
use in case you
have your own
filing code.*

*The A. I. A. classification
is given.*



ZIMC
Leaves, Irons, Gutters
and Conductor Pipes

12i

